1994

Spreading Technology Around: An Investment in Tomorrow

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Sacred Heart University, a private, liberal arts university in southwestern Connecticut has, over the past fourteen years through the Faculty of Science, Mathematics, and Computer Science established partnerships with various educational institutions and school systems for both teacher and student enhancement in the science and technology areas. Those who have benefited include teachers grades K-12, senior citizens, corporate and municipal employees in the community, and students in inner city, private, and suburban settings in grades 212.

The programs established for this purpose include the following:

(1) SMARTNET 2000 and SMART Center for teacher enhancement in the areas of science and mathematics education and the use of technology;

(2) Project 2000 and Saturday Hispanic Academy for students;

(3) The Institute of Computer Technology, a series of workshop offerings in state-of-the-art software for the corporate and municipal employee;

(4) Volunteer programs on computer literacy for inner city and suburban students as well as for retired senior citizens.

All programs were established with the goal of preparing teachers, students, and future leaders with the science and technology of today in order to face tomorrow's challenges. Without partnerships, this would not have been possible.

As we approach the twenty-first century it is an understatement to say that technology surrounds us everywhere. Multimedia, electronic highway, virtual reality, the internet, world wide web, hypertext, and cyberspace are just a few of the terms and phrases that we encounter daily in the media, in our readings, and increasingly in our institutions of learning. As this revolution engulfs the world in which we live, who has the responsibility to link people and their needs? In whose hands lie the tasks of

creating a society which can not only comprehend but also utilize and gain maximum benefit from the technological boom?

Sacred Heart University, a private, liberal arts university located in southwestern Connecticut has, in the past fourteen years, established partnerships with area school systems, corporations, municipalities, social organizations, and funding foundations in order to provide a science and technology education to the community in preparation for the next century. This paper addresses the various programs which, through partnership, have as their goal preparing teachers, students, and the community with the technology of today in order to face tomorrow's challenges.

The origin of these partnerships dates back to April, 1980 when the High School Institute for Chemistry Teachers was established at Sacred Heart by Dr. Babu George, Professor of Chemistry. The institutes were conducted in afternoons of normal teaching days and the participants were admitted free of charge on a first come first served basis. It is noteworthy that one of the earliest workshops was entitled "Computer-Aided Chemistry" where the lecturers aroused interest in the use of Apple II computers for chemistry applications. All donations were initially through Sacred Heart including the lecturers, who volunteered their

services. After several successful workshops outside contributions began to filter through and the program grew tremendously. Eventually, Eisenhower Title II funding came through in the amount of $30,000 and now total funding from all sources for these programs has surpassed $1,000,000.00. The success of this Institute lead directly into Project SMARTNET and SMARTNET 2000.

SMARTNET 2000

SMARTNET 2000 is a staff development program for teacher enhancement in precollege science and mathematics education. and the use of technology. The program is a collaborative effort between Sacred Heart University, area school districts and community resources and is co-directed by Dr. Babu George and Dr. Bette DelGiorno. The partnerships formed extend a successful staff development model from southwestern Connecticut throughout the state and impact on approximately 5,000 K-12 teachers of science, mathematics, and technology and their supervisors in 67 towns, of which five have large minority populations.

The mission of SMARTNET 2000 is to:

* improve science and mathematics education and the use of technology;

* revitalize maturing teachers and administrators;

* integrate new teachers into a systematic professional growth process

* provide opportunities for professionals from urban and suburban districts to interact and learn together.

SMARTNET 2000 has evolved from Project SMARTNET, a collaborative partnership between a public school district(Fairfield Public Schools) and a private university (Sacred Heart University) that served as a regional model of cooperation.

SMARTNET 2000 is funded in large part by the National Science Foundation for a three-year period to: assist in institutionalizing SMARTNET 2000 as a regional cooperative model for staff development; to support a systematic, ongoing K-12 staff development program that offers many strands so that teachers and administrators can select programs that apply to them to improve their content knowledge and skills; and, to provide a cadre of science, mathematics, and

technology leaders to follow-up on workshops and to assist teachers in the classroom and conduct workshops in their schools and districts. All workshops are offered free of charge to teachers.

Technology workshops in Project SMARTNET and SMARTNET 2000 have varied from programming languages like Quick Basic and Turbo Pascal to software applications such as WordPerfect for DOS, WordPerfect for Windows, Microsoft Excel, Microsoft Word, Lotus 1-2-3, Microsoft Access, Foxpro, and Internet training on the World Wide Web and Mosaic. The participants are primarily math and science teachers grades K-12 who have a varying degree of computer literacy. The goal of all workshops is not only to bring a standard of computer literacy to all teachers in the program, but moreover to encourage the teachers to incorporate the technology in their curriculum as much as possible in order to effectively bring technology skills to their students. Most workshops have been developed by Domenick Pinto, Associate Professor of Computer Science. The workshops are usually held for several hours late Friday afternoon and continued all day Saturday in order to allow the twenty participants the opportunity to gain as much knowledge as possible about the current topic. In summer there is usually one full week of computer workshops where the participants can really delve into a

topic and concentrate on a five day programming exploration or software expedition. Programming applications are geared to problem-solving in the science and mathematics area (e.g. designing a program to find area and perimeter for elementary

school teachers, a program to find all prime numbers less than 20000 or one to solve a system of three equations in three variables for high school teachers). The software applications cover a wide range of topics from keeping an electronic grade book in Lotus 1-2-3 or Excel to creating desktop publishing documents with graphics in Word or WordPerfect to properly recording data from a science experiment or statistical problem in a database like Access of Fox Pro. All workshops are limited to twenty teachers in order to maintain a hands-on environment with one person to a computer. It is a fact that all computer workshops have a waiting list of between 15 and 30 teachers. As of Fall, 1994 all computer workshops are held in Sacred Heart University's newly established Pentium lab. Quite a long journey from the Apple II computers of 1983!

PROJECT:2000

Another partnership which was developed by Dr. George at

Sacred Heart University is PROJECT:2000, A SUMMER INSTITUTE IN SCIENCE FOR ACADEMICALLY TALENTED YOUTH. This program was initiated in the summer of 1989 for children grades 2-9. A two week program has been designed to provide its participants with exciting activities in areas of their own particular interest. It provides students with the opportunity to explore areas of science and technology that they would not ordinarily be able to study in a traditional classroom. There is a very modest fee for tuition to cover the cost of instructors, assistants, and supplies. The focus of each course is on "learning by doing" in a relaxed, enjoyable, non-competitive atmosphere.

The Computer Science classes are hands-on with the morning session for grades 4-6 and the afternoon session for grades 7-9. The class size is limited to twenty and the instructor is assisted by two or three college students to provide a ratio of five or six students per teacher. All Computer Science courses in PROJECT 2000 have been designed by Domenick Pinto.

The morning session (grades 4-6) features a week of Introduction to Microsoft Windows, where the children learn what the author calls "mouse literacy", i.e., the ability to correctly manipulate a mouse to open and close windows,

switch between applications, and move around windows. In addition the students customize their desktop with color, wallpaper, and screen savers, use paintbrush, and create documents with WordPerfect for Windows and Microsoft Works. A class database is created and the children are also asked to bring in a list of their favorite sports heroes, TV favorites, movie stars, etc., in order to create their own database. The second week features an introduction to programming using Quick Basic in which the children solve simple problems using programming and then progress to doing graphics programming with various figures like lines, circles, rectangles, squares, and triangles all interspersed with 256 rich colors. The final part of the class is spent on creating personal screen savers which the students take great delight in.

The afternoon session (grades 7-9) deals exclusively with the techniques of programming in Turbo Pascal. The students are taught fundamental structures such as selection iteration and modular programming and are immediately creating games and graphics programs for their own enjoyment. The main focus of this class is to teach the fundamentals of logic for programming in a setting that is fun and interesting for this age group. Often the students will play each other's created games and sometimes challenge their teachers to do so, too.

The student-teacher ratio provides a great opportunity for some individualized instruction as needed, also.

SATURDAY HISPANIC ACADEMY IN SCIENCE

This program, founded in 1989, serves Hispanic students from grades 9 to 12 who attend Bridgeport, Connecticut public schools. The majority of these students come from poor or low income families who, because of limited resources cannot provide the encouragement and guidance to keep the students in school, and ultimately to pursue a higher education. The program is funded in part by the United Way, Bridgeport area foundations, and the state of Connecticut. It is offered free of charge to the selected participants.

It has been projected that by the year 2000, Hispanics will be the largest minority group in the United States. On the other hand, the number of Hispanic students eligible for college has remained relatively low. An estimated 40% of Hispanic high school students do not graduate.

The program administrator of the Saturday Hispanic Academy in Science is Dr. Babu George and the computer science instructor is Domenick Pinto. Classes in computer science

have centered upon learning programming techniques to solve algebra and geometry problems with all programs making full use of the rich colors and graphics available in Quick Basic. Applications tend to mesh with the ability level of the group with the emphasis being fun in learning. The group has been extremely responsive and enjoyable to work with and in many cases students have asked to stay after class time has ended in order to complete a program.

INSTITUTE OF COMPUTER TECHNOLOGY

Sacred Heart University's INSTITUTE of COMPUTER TECHNOLOGY was established in 1994 as a computer training facility for the corporate and municipal employee. One and two day workshops (non-credit) are offered in areas such as Microsoft Word, Microsoft Works, Microsoft Excel, Visual Basic, C++, Powerpoint, Microsoft Access, and Foxpro. Several partnerships are in the works with one already established between the City of Bridgeport and the Institute. The Institute has already given three training sessions to municipal employees in Bridgeport with several more planned in the next few months. It is expected that this partnership will extend for a few years as software trends continue to change and new technology becomes available. All Institute

classes are held in the Pentium lab with state-of-the-art technology such as an active matrix LCD panel for demonstrations, a color laser printer for graphics and presentations, and a totally hands-on one person, one computer atmosphere. The Institute was developed by and is directed by Domenick Pinto and is staffed by faculty members from the computer science area. The Institute is totally self-funding with the tuition received from its classes. Although the Institute has only been in existence for a few months, its reputation for quality programs has been well documented.

VOLUNTEER PROGRAMS

In addition to the above programs, Sacred Heart University has been very active in establishing volunteer programs for the community in various computer applications for inner city and suburban teens as well as for senior citizens.

A series of eight Quick Basic classes for eighth grade Honors Algebra classes in the town of Monroe, Connecticut was developed in the fall of 1993 by Domenick Pinto. The classes were two hours each and covered topics such as solving linear equations, factoring, use of the quadratic formula, and

solving systems of equations. Students were bussed from Monroe to Sacred Heart on Friday mornings with no cost to the student and no salary to the instructor. The town of Monroe kindly provided the buses. This year the same classes will be offered to a parochial school in Monroe with only the cost of transportation to be provided by the school.

For several years, students in an eighth grade gifted program from the City Of Bridgeport have been attending free computer workshops at Sacred Heart University given by Sandra Honda, Associate Professor of Computer Science at the university. The workshops were primarily designed to promote computer literacy amongst the students as part of a volunteer program to promote technology in the inner city. Both programs have been and continue to be very well received.

Since 1992, Sandra Honda has also been involved with a volunteer program for retired seniors. In this program Sandra runs a workshop every Friday for eight weeks whereby computer literacy and a taste of word processing is introduced using WordPerfect for Windows. This program is maintained by a local community center and the participants are allowed to attend the sessions free of charge. It is a very popular program.

BENEFITS

The benefits of establishing so many varied partnerships with the community are vast. The recognition of Sacred Heart University as a caring, committed institution of higher learning has resulted in a large upswing in enrollment both globally throughout the university aswell as locally within the computer science area. The newly established MCIS (Master of Science in Computer and Information Science) at Sacred Heart has been very successful after only one semester. (On a personal note one of the authors was even asked to be a computer lecturer on the QE2 this past spring for a two week transatlantic voyage to England, Ireland, and France with all expenses paid as a first class passenger.)

THE FUTURE

What future partnerships are in planning at Sacred Heart? Currently, Domenick Pinto is working on a $500,000 grant for submission to the National Science Foundation to establish a Multimedia Center complete with a multimedia classroom, authoring room, and multimedia lab for students in order to integrate sound, video, full motion, and computing to its

full extent. If funded, this technology would be integrated into all of the programs listed above. The possibilities are endless. With dedication, hard work and commitment we can help to insure that young and old, rich and poor, gifted and slow, all have the opportunity to experience the technology of today in order to make for a better tomorrow.